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REPRINTED FROM THE

New York Medical Journal

for May 27, 1893.



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GASTRIC anacidity designates that condition of the stomach in which its contents are habitually neutral or alkaline in reaction at a time when they ought to be acid. Before the contents of the stomach were systematically studied this condition escaped notice. The importance of this disorder lies in the fact that gastric digestion is not carried on, and therefore the organism is deprived of one of its greatest sources of nutrition. Furthermore, the whole task of digestion is imposed upon the intestine, which soon becomes incapable of performing it perfectly. The general health necessarily suffers, and the greater its impairment, the less perfectly can the digestive apparatus perform its functions, and the less perfectly such functions are performed the more profound becomes the general debility; thus a vicious cycle of morbid events results from disturbed primary digestion, and the conditions will not be bettered except by striking at the primary disturbing element.

Ætiology.—Gastric anacidity may occur as a secretory

neurosis, just as may hyperacidity occur; or it may be brought about by depression of the vitality from chronic disease in other parts of the body. It is sometimes the direct result of atrophy of the gastric tubules depending upon chronic gastric catarrh, or upon some general malnutrition, and, indeed, whenever anacidity is obstinately present such atrophy probably exists. I have found it present not infrequently with malignant disease of the stomach. In several cases, two of which are reported below, persistent anacidity existed with extensive gastrectasia. I have found anacidity in very corpulent and in thin persons. It is a disorder most commonly found in middle and advanced life, and in females more frequently than in males. Prolonged hard work and worry seem occasionally to induce it.

Symptoms.—The symptoms accompanying gastric anacidity are not characteristic. They are in some cases located in or about the stomach, while in other cases remote symptoms—such as anæmia, backache, headache, languor, and weakness—are complained of. The symptoms alone often arouse a suspicion of some totally different intragastric condition. In some cases paroxysms of gastralgia occur, independently of the time of eating. Anorexia is not usually present in this state; on the contrary, there frequently exists a morbid craving for food, which, however, is curbed by the patients, who fear that food will cause pain or some other distressing symptom. Gastric flatulency is occasionally very prominent in this disease. Nausea and vomiting sometimes occur. Burning, fullness, weight, and indefinite distress are more often complained of than any other symptoms. In some cases chronic diarrhœa exists. The graver forms of the disease entail serious failure of the general health and render patients pale, weak, thin, and wretched year after year.

Diagnosis.—External examination with a view of deter-

mining the size, shape, and position of the stomach in a proportion of the cases of anacidity reveals marked gastrectasia. The existence of dilatation is confirmed by the direct examination, but by repeated investigations these dilated stomachs are often found comparatively sufficient as regards motion. Direct examination also reveals the true state of gastric digestion. If the gastric contents are examined three hours after a meal of meat, bread, and potato, the foods are found practically unchanged, simply watersoaked, and floating or sinking in the wash water. They show no signs of having been acted upon by solvents; they are not dissolved or disintegrated sufficiently to stain the wash water. The reaction of the contents is usually neutral, although slight alkalinity may be present. Mucus may or may not be present; usually it is not present in large quantities. On the whole, the contents appear as though they had been lying for a few hours in a rubber bag or in a bladder.

Chemical examination shows that no gastric digestion has taken place. The contents are anacid, and the filtrate contains at best but a little dissolved albumin. No syntonin, none of the albumoses, no peptone are present. Rennet is usually absent. The starch in solution is sometimes partially changed, as is shown by the erythrodextrin reaction (purple with Lugol's solution), or the dissolved starch not uncommonly present unchanged.

These intragastric conditions are found every day for weeks and every week for months and every month for years; so there is no question as to the reality of gastric anacidity which, so studied, conveys to our minds not only an absence from the stomach of HCl and lactic acid, but a state of complete and permanent abeyance of gastric digestion. The bearing of such a condition upon the general health is of paramount importance. The following four cases of this

disease consulted Dr. Charles G. Stockton, and, as I had the privilege of treating them, by his courtesy I am able to report them.

CASE I.—Mrs. H., aged forty-three, married; mother of two healthy children; occupation housewife. Family history negative. The patient was always healthy until four years ago, when she had a severe attack of retching and vomiting. Since that time she has had at irregular periods paroxysms of intense gastralgia lasting several hours and simulating biliary colic. The bowels are always sore for about two weeks after an attack. She has never found any gall-stones. The gastralgia is accompanied by vomiting with great restlessness and nervous excitement. She screams repeatedly while in pain and manifests a neurotic state in many ways. She sleeps poorly if in dread of pain, and can not lie down when it is present. Anæsthesia of the conjunctivæ and hyperæsthesia over the abdomen are present. Motion is slow, and the face expresses melancholy. The heart is weak; blood-vessels not diseased; lungs normal; appetite good during the intervals between the attacks of pain. Nervous belching at times persistent. Tongue small and slightly cyanosed, with a universal thin, white coat. Bowels very regular. Skin thick, muddy, moist, and relaxed. Urine hyperlithuric. Weight, two hundred pounds.

Direct examination of the stomach in this case twelve times in two months always revealed anacidity and suspension of gastric digestion. On July 23, 1891, two hours and a half after a roll and coffee, I found the former present entirely unchanged, with the contents neutral in reaction, no mucus, no syntonin, no albumoses, no peptone, no rennet, dissolved starch undergoing transformation under continued salivary action.

On July 24, 1891, the stomach was empty two hours after half a pint of peptonized milk, and the first water was neutral in reaction.

Anacidity was found at all the subsequent examinations. I never found any evidence that gastric digestion had taken place. The motion was sometimes active, sometimes sluggish.

The treatment consisted in the administration of HCl, predigested foods, *mistura asafœtidæ*, plain mixed diet, cold spinal douches, and the application of the constant current within the stomach. Great relief followed, and the patient experienced no gastralgia until January of this year (1893), when I was called to see her suffering with the old pain and manifesting the old nervous symptoms. I again prescribed nervines and hydrotherapy, which were followed by relief.

CASE II.—Mrs. C., aged thirty-six. Married and had two healthy children. Had diarrhœa for several years. External examination of the stomach showed the lower border on a level with the umbilicus; splashing was readily elicited. Numerous direct examinations of the stomach, extending over a period of several months, invariably showed the food present unchanged and mixed with more or less mucus. The contents were neutral in reaction; no albumoses, no peptone, were ever found. Rennet was occasionally present. Starches were incompletely changed. In this case the motion was usually sufficient to empty the stomach in about five hours, and thus tax the intestine with the whole labor of digestion. Eye-strain in this case existed to the extent of the following refractive error: R. + 0.75 D. $\bigcirc$ + 0.50 D. c. ax. 70, V. $\frac{5}{8}$. L. — 0.25 D. $\bigcirc$ 1.25 D. c. ax. 105, V. $\frac{5}{8}$ Snellen.

CASE III.—Mr. H., aged fifty. Eight years ago, while in Egypt, had a severe attack of vertigo and nervousness. Since that time has suffered repetitions of the same. December 20, 1892, appetite poor, eructations complained of; no other direct gastric symptoms. Bowels usually regular. External examination shows lower border of the stomach about four inches below umbilicus; clapotage marked. I made direct examination of the stomach two hours and a half after oatmeal, cream, rolls, baked apples, and coffee. All the food was entirely undigested, lying in a water-soaked condition. The contents were neutral in reaction; a good deal of tenacious, ropy mucus was present. No evidences of gastric digestion were discovered, as the albumoses and peptone were absent, the dissolved starch was not changed, and rennet was not present. I have since made many examinations of the stomach contents, but always with

results similar to the above. The stomach usually emptied itself into the duodenum in from five to six hours after meals. The flesh, blood, and strength of this patient were very much lowered.

CASE IV.—Mrs. A., aged thirty-seven. Married. December 20, 1892, is much emaciated and very pale. Complains chiefly of gastric flatulence with fainting spells when the gas distends the stomach. Bowels regular. Lower border of the stomach three or four inches below the umbilicus; no gastrop-tosis. I withdrew the stomach contents December 21st by the ordinary means, three hours and three quarters after a breakfast of beefsteak, bread and butter, coffee with cream and sugar. The food was unchanged, contents neutral, no biuret reaction, rennet absent, dissolved starch digested. Repeated examinations of the stomach contents at periods varying from two to six hours after eating, and after various test meals, failed to reveal the slightest evidence of gastric digestion of albuminoids. The stomach usually emptied itself from five to six hours after meals.

The urine in Case I was hyperlithuric; in Case II, negative; in Case III, negative; in Case IV, somewhat super-acid, otherwise negative.

Prognosis.—If the affection is due to a purely reflex disturbance of innervation and the patient is young, the prognosis is most favorable. On the other hand, if the patient is middle-aged or old, and has passed through great physical and mental hardships, and if the condition persists for months without amelioration despite the best remedial efforts, probably atrophy of the gastric tubules has occurred and the prognosis is very unfavorable so far as restoration of gastric digestion is concerned. Life is not endangered by this disease except in so far as it renders the organism less resisting to other diseases.

Treatment.—When a diagnosis of gastric anacidity has been made the therapeutic indications are clear. We

should try to re-establish gastric digestion by giving HCl in copious doses, and if no peptonization takes place under its influence, pepsin ought to be given with it, as atrophy of the gastric tubules may exist. Papain may be used, as it sometimes digests nitrogenous foods in a neutral medium. Large doses of nux vomica or strychnine and physostigma are useful both for their general and local effects. Certain direct local stimulants are sometimes useful; for instance, salt, capsicum, mustard, horseradish, Belfast ginger ale, etc., given with or before meals in moderate doses. Extract of malt affords great benefit if given for a long time. Quassin, quinine, and other vegetable bitters with arsenic are useful in some cases. It is a mistake, however, to give too much medicine in this condition, as, indeed, it is in almost every disease.

If the patient is neurotic, as in the first of the four cases above reported, phosphorus, sumbul, asafoetida, valerian, electricity, and hydrotherapy are indicated. Massage, Swedish movements, Emersonian exercises, vapor baths are all to be chosen in preference to shotgun prescriptions. Peripheral irritations; such as ovarian disease or eye-strain, should be corrected at the outset.

The environment of the patient should be investigated, and overwork, worry, grief, unhappiness, or undue excitement should be obviated if possible. Prolonged change of scene and climate sometimes brings improvement. The diet should consist of predigested foods, as, for instance, peptonized milk and peptonized beef. These preparations afford extra nutriment to the patient, as they are largely absorbed from the stomach. All rich mixed dishes, such as mince pies and plum pudding, should be proscribed; while plain puddings, such as bread, rice, sago, tapioca, and corn-tarch, may be allowed. The succulent fruits are very grateful, and the acid juices of orange, grape-fruit, and

lemon seem to exert a favorable effect upon the stomach. Lime juice and acid phosphate also may be given. The major part of the food should consist of milk, eggs, tender meats, stale bread, zwieback, oysters, salt and fresh fish, well-cooked mashed potatoes, the succulent vegetables, etc. Salt fish and salt meats should be eaten freely, as the chlorides contained in them favor the development of HCl in the stomach. Common salt should be used freely at table.

The direct treatment of the stomach is very important. Lavage ought to be practiced once or twice a week for many months, perhaps, at intervals, for years. Löwenthal* recommends the use of a 0.6-per-cent. solution of sodium chloride at a temperature of 104° F. for lavage in these cases. I have been in the habit of using a weak saline solution for lavage in cases of hypochlorhydria, and in the treatment of anacidity I adopt the same plan.

The contents should be examined each week as to their reaction, which if acid should prompt the tests for HCl and lactic acid. Not infrequently, in several cases of gastric anacidity not reported in this paper, I have found the re-appearance of lactic acid, and in a few cases the re-establishment of HCl secretion. Electricity, interrupted and continuous currents, I use directly applied to the mucous membrane of the stomach by means of the Stockton electrode, and, in our experience, no measure yields better results. Dr. Einhorn† and I‡ have shown that the faradaic and galvanic currents will each stimulate the secretion of HCl in healthy and in some diseased stomachs. Therefore I use them both with a view of exciting the secretions of gastric juice, while I use the faradaic current to stimulate

* *Med. Week*, January 6, 1893.

† *Medical Record*, May 9, 1891, January 30 and February 6, 1892.

‡ *Ibid.*, January 13, 1891.

gastric peristalsis. If atrophy of the gastric glands has taken place, no therapeutic measure can renew their function, but we ought to work with the hope that atrophy has not occurred. In the last three of the cases above reported I believe atrophy existed, because after months of treatment the reappearance of gastric digestion was not noticed, although the motions of the stomach increased appreciably.

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